

ceased. They attempt to give the women under thirty-five enough radium to control the symptoms, but not enough to stop menstruation, and it is difficult to judge the amount necessary in each case. It is better to give a small dose, however, and if there is a recurrence of the profuse flow, repeat the dose in from three to six months than to give enough at the first treatment to stop menstruation. Patients over thirty-five are given larger initial doses, as it is not so important that menstruation shall continue, but they always try to give a dose to all patients under forty which will control rather than stop menstruation. They have seldom given more than 50 mg. for fourteen hours at one treatment, since they believe that it is better to repeat the treatment if necessary, as it is sometimes in cases of a fairly large tumor. In a series of 349 patients it was necessary to repeat the treatment in 64 and an operation was done later in 20. Only 4 of the 20 had been given a second radium treatment and two had operations elsewhere too soon after treatment to obtain the effect of the radium. Menstruation became regular and normal in 11 per cent.

**Ovarian Therapy.**—In the light of theoretic, experimental and anatomic knowledge combined with long-continued observations, our general estimate of the ovary as a gland of internal secretion has been briefly summarized by GRAVES (*New York Med. Jour.*, 1920, cxii, 697) as follows: For complete somatic growth and sexual development the normal secretion of the ovary is essential. To what extent the action of the secretion is direct and how far it serves as a balance to other more powerful secretory influences is a matter of speculation. During menstrual life, and especially during the years of adolescence, the proper functioning of the ovaries has a very important bearing on the physical and mental character of the individual. Disfunctions of the ovaries are usually attended with various neuroses. Some of these may be due to the direct disharmonious action of other endocrines, especially those that have an affinity for the autonomic nervous system. In the adult the ovarian secretion plays a somewhat minor role in the human economy, as is indicated by the comparatively slight physical changes that take place after ablation or the natural menopause. This has an important bearing on the question of removing the ovaries during hysterectomy: During adult life the most definite evidence of the existence of a true internal secretion from the ovaries is the occurrence of hot flushes and genital atrophy after ablation. These symptoms point to a balancing rather than a direct action of the ovarian secretion. From an organotherapeutic viewpoint the ovary must be regarded as primarily a homogeneous gland, the essential secreting structure being the interstitial cells. Variations in secretion of different parts of the gland are probably differences of degree rather than of kind. A selective action of the secretions from different parts of the gland is not yet proved, and if it exists is probably quantitative. The therapeutic value of ovarian preparations in Graves's experience may be stated somewhat as follows: All the ovarian preparations exert a specific influence on hot flushes. In this respect the residue is the most intensive, but the difference in the efficacy of the various preparations depends to some extent on the idiosyncrasy of the patient. In the treatment of menstrual irregularities ovarian extracts exhibit an

undoubted specific action but this action is inconstant. In temporary functional amenorrhea, delayed menses, dribbling before and after catamenia and small clotting, ovarian therapy is fairly reliable, and is at least the best asset that the gynecologist at present possesses for these symptoms. Theoretically for these affections the ovarian action may be enhanced by the addition of thyroid and pituitary extract, but of this Graves's personal clinical experience has not been entirely convincing. For the permanent amenorrheas, especially those associated with pluri-glandular disturbances, ovarian therapy has little or no effect on restoring the menstrual function, but is of undoubted value in improving the patient's general health. It is best in these cases to administer the ovarian treatment in considerable doses, separately from the other gland extracts. In certain types of dysmenorrhea ovarian feeding is efficacious, occasionally brilliantly so, but it is unreliable and often disappointing after giving early promise. In the severe types of dysmenorrhea it is of comparatively little help. For menorrhagia and metrorrhagia ovarian therapy is not indicated.

**Ovarian Transplantation.**—There can be few gynecologists who have never had the experience of being obliged to open the abdomen at a longer or shorter period after a previous operation for salpingitis, because an ovary that had been left had become bound down with adhesions and was cystic. Encountering a number of these cases in his practice, BELL (*Lancet*, 1920, *exciv*, 879) came to the conclusion that it is not worth while leaving an ovary in a badly infected area, when further conception is impossible owing to the frequency with which subsequent lesions occur. Some surgeons have solved this problem by frankly castrating the patient, but Bell has adopted the method of ovarian grafting. His first operation on the human subject was performed in 1912, but it was not until 1916 that he adopted the procedure as a routine practice in certain well-defined circumstances. The following points in regard to the technic of this procedure are important: All grafts in the human subject must be autoplasmic. After the ovaries have been removed the ovarian tissue from which the graft is to be cut should be dropped to the bottom of the pouch of Douglas, where it will be kept warm and moist until the end of the operation, when it is required for grafting. When possible, healthy ovarian tissue, which may include all the elements of the organ, should be used. This should be criss-crossed with a sharp knife into adherent fragments after the dense tunica albuginea has been removed, in order to favor rapid vascularization of the grafted tissue. The graft, provided there is no suppurative infection of the ovary, may be placed in the rectus muscle before the laparotomy wound is closed. He has also implanted the graft in the uterus or in what was left of this organ. It is most important that the graft should be placed in a vascular site, but should not be surrounded with blood. Too much care cannot be taken in placing the graft among the muscle fibers. If the ovaries be badly infected and more or less completely converted into the walls of abscess cavities, whatever tissue can be removed should be implanted in the internal oblique muscle alongside the drainage tube, which in such circumstances is passed through a stab wound well away from the central incision into the pelvis. He has never seen an infected graft slough; moreover, in

several such cases menstruation has subsequently occurred. In only a few cases is menstruation regular after ovarian grafting. It usually recurs at longer intervals than normal—that is to say, every six weeks or two months. Some patients menstruate a few times and then cease and minor symptoms of the menopause may appear. Bell's conclusions, based on a fair experience, lead him to advocate very strongly the practice of ovarian grafting in suitable cases. Nevertheless, he insists that this procedure be looked upon as a measure of necessity, which can never be weighed in the balance against the preservation of the natural connections of the normal ovary.

---

## PATHOLOGY AND BACTERIOLOGY

UNDER THE CHARGE OF

OSKAR KLOTZ, M.D., C.M.,

DIRECTOR OF THE PATHOLOGICAL LABORATORIES, SAO PAULO, BRAZIL,

AND

DEWAYNE G. RICHEY, B.S., M.D.,

ASSISTANT PROFESSOR OF PATHOLOGY, UNIVERSITY OF PITTSBURGH, PITTSBURGH, PA.

---

**A Study of the Oxidase Reaction with A-Naphthol and Paraphenylenediamine Tumors.**—The work reported by MENTEN (*Jour. Cancer Res.*, 1920, v, 321) consists in the application to tumor tissue of an oxidase test previously studied in detail in various types of normal tissue. The reagent used was an aqueous solution of a-naphthol and paraphenylenediamine and when frozen sections of tumors were placed in this solution there developed within them a blue violet color whose intensity varied according to the type of tumor and the functional activity of its cells. While diverse types of neoplasms were studied the most striking results were obtained in fibrosarcomata where all gradations of color from a maximum in the degenerating areas to a faint reaction in the actively growing parts were met with. In the latter the color appeared only in the fine perinuclear granules which had a faint mauve appearance. The nucleus was free from any reaction. As the cell matured the reaction deepened to a violet in the perinuclear region and the chromatin was perceptible in the nucleus as faint mauve threads and knots. When through lack of adequate blood supply degenerative changes occurred in the cells the oxidase reaction became still further increased in the perinuclear granules and the nucleus and finally in the late stages of the degenerative process the whole cell protoplasm was converted into clumps of blue-black stained material. An attempt is made to interpret the phenomenon observed on a physicochemical basis. Since the development of the color is dependent upon the oxidation of the reagent and oxidation is due primarily to the acquisition of a positive electric charge it is postulated that any increase in the intensity of the color is due to the liberation of a positive charge within that tissue. That increased acidity occurs in degenerating tissues is a

well attested fact. The liberation of this positive charge within the cell is accompanied by conversion of potential into kinetic energy. In the actively growing parts where the oxidase reaction becomes progressively diminished, the reverse process occurs. It is assumed that it is those granules with high lability as manifested by wide variations in the oxidase reaction which most readily tend to become the primary site of metabolic changes of the nature of an anaplasia.

**The Peroxide Reaction in Three Cases of Multiple Myeloma of the Bones with Remarks Concerning the Nosological Position of these Tumors.**—Owing to the lack of definite knowledge concerning the origin of the cellular elements of multiple myeloma of the bones, a considerable confusion as to their proper classification has arisen. The various views which have been suggested as to the histogenesis of these rare tumors are fully discussed by MORSE (*Jour. Cancer. Res.*, 1920, v, 345) who has studied three cases, the autopsy findings of which are reported in detail. The gross appearance of these new growths is very characteristic. They arise in the bone marrow by multiple foci whose extension causes marked erosion of the bone. There is little or no tendency to callus formation or reparative processes. Metastases occurred in one of the cases reported by Morse. Microscopically the tumors are composed of cells irregularly oval in outline and contain an eccentrically placed nucleus. The nucleus is vesicular and shows a characteristic mural arrangement of the chromatin. The protoplasm is basophilic. Because of the close resemblance morphologically of these cells to the plasma cell and further because they react negatively to both Goodpasture's and Evan's oxidase technique, Morse concludes that they are not of myeloblastic origin and have no relationship to the leukemic group, but that "they spring from a series of cells whose specific function is bone absorption." It is suggested that they are related to the osteoblast and may be considered as heteroplastic osteoblasts.

**The Biliary Factor in Liver Lesions.**—ROUS and LANIMORE (*Jour. Exp. Med.*, 1920, xxxii, 249) attempted to arrive at a better understanding of the share of bile in the causation of hepatic lesions distinguished by a cirrhosis with evidence of stasis in the finer bile ducts and inflammation in their walls, by producing in rabbits obstruction to the bile flow at different levels. The authors confirmed the work of previous investigation in producing bile stained parenchymal necrosis after obstruction of the common duct, which was followed by a spreading stellate cirrhosis and connective-tissue proliferation throughout Glisson's capsule, resulting finally in a roughly hob-nailed organ. This rabbit lesion is mixed, involving injury throughout the biliary tract. By causing local obstruction at different duct levels, the authors attempted to produce cirrhotics of uncomplicated types, resembling lesions in man. The bile duct and portal branch to the main liver mass of rabbits were ligated. There was found to result atrophy of the lobule and an evenly distributed monolobular cirrhosis. When the portal trunk of the main liver mass was ligated and seventeen to twenty-three days later the bile duct from this region was ligated, the main liver mass was found to have undergone atrophy. There was no icteric tinting of the parenchyma or dilatation of the bile passages. Evidently a very slight increase of